

# (12) UK Patent Application (19) GB (11) 2 093 149 A

(21) Application No 8104664

(22) Date of filing 14 Feb 1981

(43) Application published  
25 Aug 1982

(51) INT CL<sup>3</sup>  
F16H 7/14

(52) Domestic classification  
F2Q 2T2A6

(56) Documents cited  
GB 0740164  
GB 0717745  
GB 0585647  
GB 0535420

(58) Field of search  
F2Q

(71) Applicants  
Packaged Air  
Conditioning Equipment  
Limited,  
Dockfield Industrial  
Estate, Shipley BD17 7BE,  
West Yorkshire

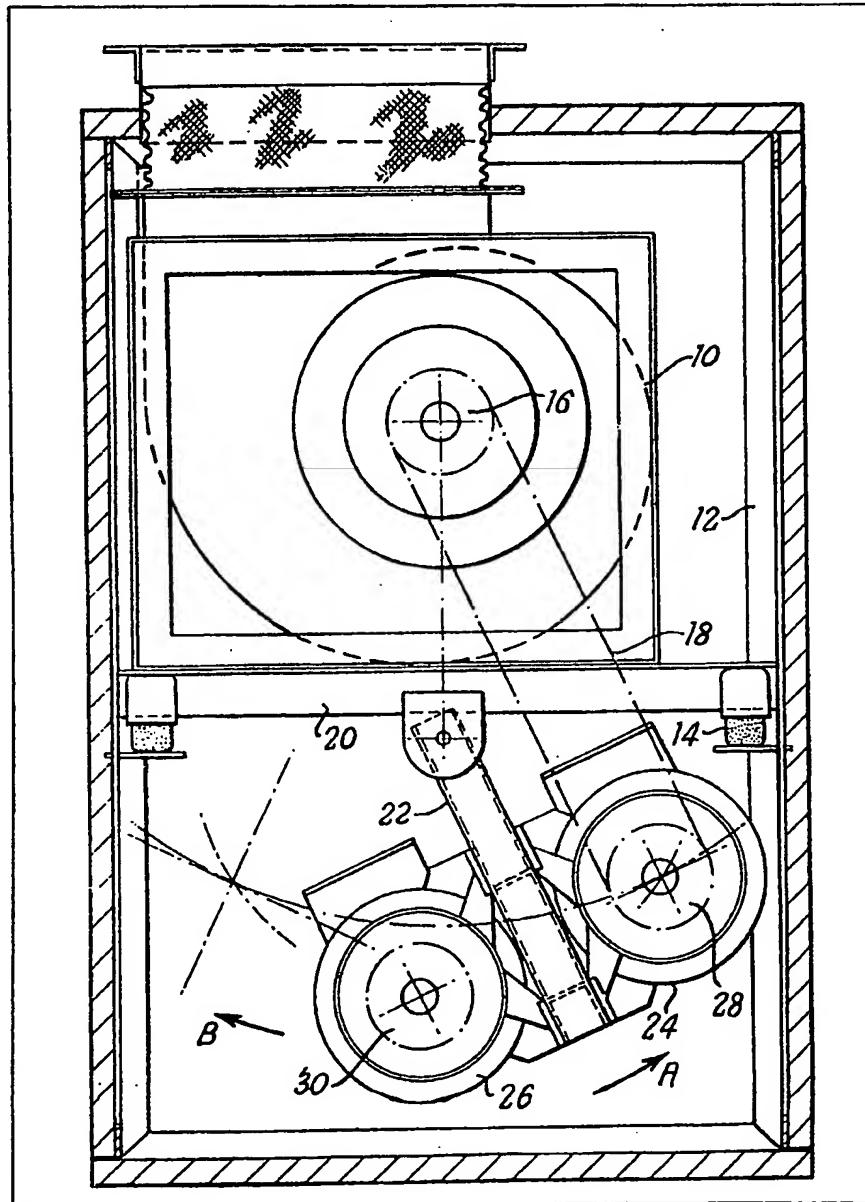
(72) Inventor  
Hugh Barrie Doyle

(74) Agents  
P. R. Wharton and Co.,  
11th Floor Tower House,  
Merrion Way, Leeds  
LS2 8PB

## (54) Drive unit

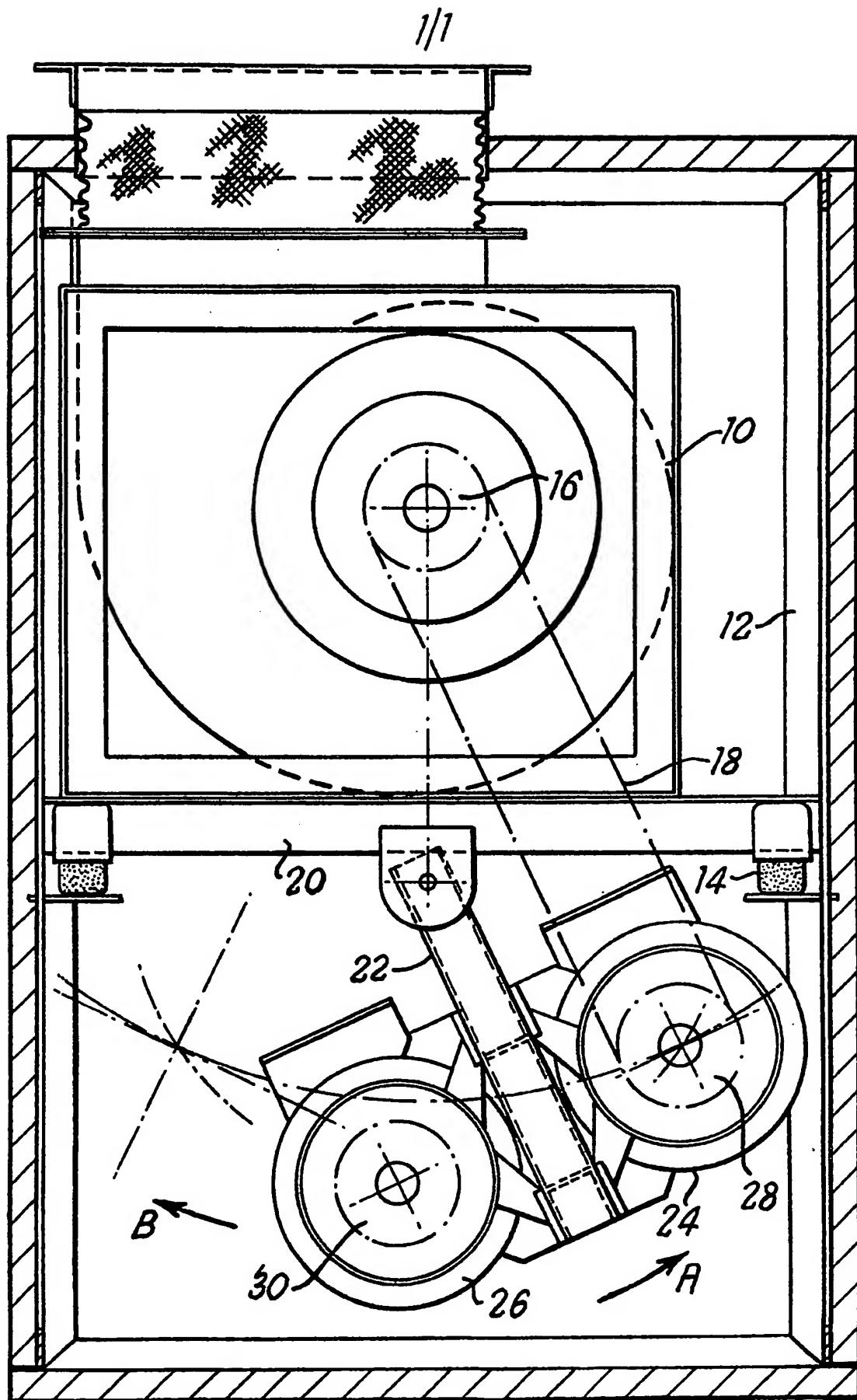
(57) A drive unit for driving a fan 10 in an air conditioning system by means of a drive belt 18 and pulley 16, 26, 28 arrangement, has a drive motor 24, and stand-by motor 26, mounted on a bracket 22 which is pivoted with

respect to the fan 10. The necessary tension in the drive belt 18 is maintained by the weight of the motor assembly. The drive belt 18 may be changed, or the motors changed from run to stand-by, without the need of tools.



GB 2 093 149 A

2093149



SPECIFICATION  
Drive unit

This invention relates to a drive unit and in particular relates to a drive unit for use with air conditioning systems.

In air conditioning systems, air is distributed throughout a building, generally via ducts from a central fan unit. The air is taken in, filtered, and heated or cooled as the case may be, from whence it is fed by the fan through the ducts for distribution throughout the building. The fan is driven by a suitable drive unit, usually an electric motor, generally by means of a fan belt and pulley system. Should a fan belt break, or a motor break down, it is necessary for a mechanic or engineer to open the system to get at the motor and drive, unbolt the motor from its brackets, replace the motor or drive belt as the case may be, adjust the tension and retighten the fixing bolts.

The invention seeks to provide a simplified drive unit for a fan in which the drive belt or drive motor can be replaced very quickly without the use of any tools.

In its broadest aspect the invention comprises a drive unit for driving a mechanism such as a fan by means of a drive belt and pulley arrangement, in which the drive motor is pivotally mounted with respect to the driven unit and the necessary tension in the drive belt is maintained by the weight of the drive motor.

In many cases, for example in a sensitive environment, such as hospitals, computer installations and the like, it is usual for a stand-by motor to be located close to the operating drive motor (known as "stand-by" and "run" motors respectively) for rapid availability in the case of breakdown. In the preferred practice of the present invention, a stand-by and run motor are provided in tandem on a bracket pivotally mounted as before. In this case, should a drive belt break, it is only necessary for an operative to pivot the motors upwardly, slip a new drive belt about the drive and driven pulleys, and allow the motor to pivot downwardly under its own weight thereby tensioning the belt. Should the run motor fail, a similar operation enables the drive belt to be placed on the pulley of the stand-by motor, and, after changing the electrical connections, the unit can once again be operated. This operation is extremely quick and requires no specialised tools, not even spanners, and can be carried out by untrained operatives.

The invention will be described further, by way of example, with reference to the accompanying drawing, the sole figure of which is an end elevational view of a fan and drive unit of an air conditioning system constructed in accordance with the invention.

Referring to the drawing, an air conditioning fan unit 10 is mounted within a framework 12 on resilient mountings 14. The fan unit 10 has a driven pulley 16 capable of receiving a drive belt 18. Pivotally mounted on a cross-piece 20 of the framework 12 is a bracket 22 carrying drive 24

65 and stand-by 26 motors. Each of the motors has a respective drive pulley 28, 30. As shown in the figure, the run motor 24 and its drive pulley 28 is connected to the driven pulley 16 by means of the drive belt 18. In this position, it can be seen that 70 the motor assembly on the bracket 22 is displaced from the vertical and the net downward force generated by the motor assembly on the bracket 22 is sufficient to tension the drive belt 18 to the required degree. Naturally, the degree of tension 75 can be adjusted by shortening or lengthening the bracket 22 or otherwise altering the geometry of the system.

Should a drive belt 18 break and need to be changed, an operative merely swings the motor 80 assembly on the bracket 22 in the direction of arrow A and slips a fresh drive belt 18 over the pulley 16 and 28. Lowering the motor assembly retensions the belt and the unit is ready to operate once more.

85 Should the run motor 24 fail, the drive belt 18 is removed from the motor 24, the motor assembly of the bracket 22 is moved in the direction of arrow B and the drive belt 18 placed over the pulleys 16 and 30. Releasing the motor 90 assembly as before tensions the drive belt and the unit is ready to operate with the stand-by motor. A new run motor may be obtained and installed in the system at a convenient time.

Thus it can be seen that the drive unit of the 95 invention enables drive belts to be changed extremely quickly and simply, and also enables stand-by motors, where fitted, to be brought into operation extremely simply and quickly without the necessity of skilled labour or the use of tools.

100 For certain end uses, in which space is limited, there may not be sufficient room to give the lever arm of the bracket 22 enough length to produce the necessary tension in the drive belt 18. In this case, the weight of the motor assembly can be 105 augmented, either by physically attaching weights to it, or by a spring mechanism which increases the gravitational bias.

While the invention has been described in 110 relation to the drive of a fan for an air conditioning unit, it will be appreciated that the drive unit of the invention will be applicable in any situation calling for a belt and pulley drive system.

**CLAIMS**

1. A drive unit for driving a driven unit by means 115 of a drive belt and pulley arrangement, in which a drive motor is pivotally mounted with respect to the driven unit and the necessary tension in the drive belt is maintained by the weight of the drive motor.

120 2. A drive unit as claimed in claim 1 in which the drive motor is mounted on a bracket, and the bracket is pivotally mounted in respect to the driven unit.

125 3. A drive unit as claimed in either of claims 1 and 2 in which a stand-by motor is provided as well as the drive motor.

4. A drive unit as claimed in claim 3 in which the drive and stand-by motors are mounted

together on a bracket pivotally mounted with respect to the driven unit.

5. A drive unit as claimed in any one of claims 1 to 4 in which the driven unit is a fan.

5 6. A drive unit as claimed in any one of claims 1 to 5 in which the tension of the drive belt is adjusted by altering the lever arm of the bracket.

7. A drive unit substantially as hereinbefore described with reference to and as illustrated in 10 the accompanying drawings.

8. An air conditioning system incorporating a drive unit as claimed in any one of claims 1 to 7.

---

Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1982. Published by the Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.